Index Methodology

Bloomberg Commodity Equal-Weighted Sector Index

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Bloomberg Professional Services

Indices

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Version Tracker

Date	Update
1/20/2022	Bloomberg Commodity Equal-Weighted Sector Index methodology written.
5/12/2023	Updated to include the Bloomberg Commodity Equal-Weighted Sector GBP Daily Hedged Index
6/7/2024	Publication in new format

Section 1: Index Overview

The Bloomberg Commodity Equal-Weighted Sector Index aims to track the performance of holding a long position of commodities futures contracts equally (25%) divided into four BCOM commodity groups (sectors). The weights in each commodity group are proportional to BCOM weights. The four commodity groups are the Grains, Softs, and Livestock (combined), Energy, Industrial Metals, and Precious Metals. The index rebalances quarterly on the close of the last business day of December (using BCOM Target weights), March, June, and September (Using BCOM closing weights, through the 5-business day roll period as described in Section 2). The Total Return version is calculated using the returns of the underlying excess return index and the return of cash collateral invested in the 3-Month T-Bill. The index is also calculated in a non-US Dollar daily hedged version; the Bloomberg Commodity Equal-Weighted Sector GBP Hedged Daily Indices Excess and Total Return Index.

Table 1: Bloomberg Commodity Equal-Weighted Sector Index

Index Names	Ticker	Currency	Index Commencement Date
Bloomberg Commodity Equal-Weighted Sector ER Index	BCEWSER	USD	12/20/2022
Bloomberg Commodity Equal-Weighted Sector TR Index	BCEWSTR	USD	12/20/2022
Bloomberg Commodity Equal-Weighted Sector GBP Hedged Daily ER Index	BCEWSDEP	GBP	5/12/2023
Bloomberg Commodity Equal-Weighted Sector GBP Hedged Daily TR Index	BCEWSDTP	GBP	5/12/2023

To maintain the long position of the basket, contracts are 'rolled' from the expiring futures contract to a new contract farther down the futures curve with a longer expiry date. All commodities will roll on the first through the fifth **Business Day** of each calendar month. An **Index Level** or Business Day is determined on a day in which BCOM is calculated.

The Bloomberg Commodity Equal-Weighted Sector Index is denominated in U.S. dollars and have a **Base Date** of December 31st, 2007, with a **Base Index Level** of 100.

Section 2: Index Limitations

Though the Indices are designed to be representative of the markets they measure or otherwise align with their stated objective, they may not be representative in every case or achieve their stated objective in all instances. They are designed and calculated strictly to follow the rules of this Methodology, and any Index Level or other output is limited in its usefulness to such design and calculation.

Markets can be volatile, including those commodity market interests which the Indices intend to measure or upon which the Indices are dependent in order to achieve their stated objective. For example, trading in futures contracts on physical commodities, including trading in the Index components, is speculative and can be extremely volatile. Market prices of the Index components and the underlying physical commodities may fluctuate rapidly based on numerous factors, including changes in supply and demand relationships (whether actual, perceived, anticipated, unanticipated or unrealized); weather; agriculture; trade; fiscal, monetary and exchange control programs; domestic and foreign political and economic events and policies; disease; pestilence; technological developments; changes in interest rates, whether through government action or market movements; and monetary and other government policies, action and inaction.

The current or "spot" prices of the underlying physical commodities may also affect, in a volatile and inconsistent manner, the prices of futures contracts in respect to the relevant commodity. These factors may affect the value of the Indices in varying ways, and different factors may cause the prices of the Index components, and the volatilities of their prices, to move in inconsistent directions at inconsistent rates.

In addition, market trends and changes to market structure may render the objective of the Index unachievable or to become impractical to replicate by investors.

In particular, the Bloomberg Commodity Equal-Weighted Sector Index aims to track the performance of holding a long position of commodities futures contracts. The Index is therefore subject to subject to risk of holding a commodity futures contract which may fluctuate rapidly and may be subject to temporary distortions or other market disruptions based on numerous factors, including changes in supply and demand relationships (whether actual, perceived, anticipated, unanticipated or unrealized), weather, agriculture, trade, fiscal, monetary and exchange control programmes, domestic and foreign political and economic events and policies, disease, pestilence, technological developments, changes in interest rates, whether through governmental action or market movements, and monetary and other governmental policies, action and inaction.

Historical Index Levels published prior to the Index launch date are considered hypothetical. Historical Index Levels should not be considered as an indication of future performance.

The Bloomberg Commodity Equal-Weighted Sector Index is comprised of liquid commodity future contracts. If any commodity future contract is terminated or replaced in accordance with the rules of the Index methodology, a comparable commodity futures contract may be selected by BISL. The replacement of a commodity future contract may cause the level of the Index to change or be adjusted.

BISL may discontinue or suspend calculation or publication of the Indices defined in this methodology. If this happens, BISL shall use reasonable efforts to provide advance notice through an Index announcement made available via bloombergindices.com and on the Bloomberg Terminal via INP <GO>.

Section 3: Index Calculation

The Bloomberg Commodity Equal-Weighted Sector Index aims to track the performance of holding a long position of commodities futures contracts equally (25%) divided into four BCOM commodity groups (Table 2). The weights in each commodity group are proportional to BCOM weights. The four commodity groups are the Grains, Softs and Livestock (combined), Energy, Industrial Metals, and Precious Metals. The index rebalances quarterly on the close of the last business day of December (using BCOM Target weights), March, June, and September (using BCOM closing weights), through the 5-business day roll period. Target weights will be rounded to 8 decimal places.

Table 2: Commodity Groups

Commodity Groups	Ticker	Commodity	Group Weight
Agriculture & Livestock	W	Chicago Wheat	25%
	KW	Kansas City Wheat	
	C	Corn	
	S	Soybeans	
	SM	Soybean Meal	
	BO	Soybean Oil	
	CT	Cotton	
	KC	Coffee	
	SB	Sugar	
	LC	Live Cattle	
	LH	Lean Hogs	
Energy	CL	WTI Crude Oil	25%
	HO	NY Harbor ULSD	
	XB	RBOB Gasoline	
	CO	Brent Crude Oil	
	QS	Low Sulfur Gas Oil	
	NG	Natural Gas	
Industrial Metals	HG	Copper	25%
	LA	Aluminum	
	LL	Lead	
	LN	Nickel	
	LX	Zinc	
Precious Metals	GC	Gold	25%
	SI	Silver	

Lead was added to BCOM during the 2023 Annual Rebalance

Annual Target Weight Calculation

The target weights for the Bloomberg Commodity Equal-Weighted are derived from the Annual BCOM Target Weights. For each commodity group, on the close of the last business day of the year, calculate the individual commodity index weights for each constituent by taking the BCOM Target weights of the individual constituent and dividing it by the sum of commodity constituent weights within each of the four groups, and multiply it by 25% as shown below:

$$EWTW_i = \frac{BCOM\_TW_i}{\sum_i \mathrm{BCOM\_TW_i}} * .25$$

Where:

$EWTW_i$ is the Bloomberg Commodity Equal-Weighted Target Weight of the individual commodity futures contract, rounded to 8 decimal places.

$BCOM\_TW_i$ is the BCOM Annual Target Weight of commodity futures contract i.

Quarterly Target Weight Calculation

The target weights for the Bloomberg Commodity Equal-Weighted are derived from the **BCOM Closing Weights**. For each commodity group, on the close of the last business day in March, June, and September, calculate the individual commodity index weights for each constituent by taking the BCOM Target weights of the individual constituent and dividing it by the sum of commodity constituent weights within each of the four groups, and multiply it by 25% as shown below:

$$EWTW_i = \frac{BCOM_{CW_i}}{\sum_i \mathrm{BCOM}_{\mathrm{CW_i}}} * .25$$

*****Preformed for each commodity group*

Where:

$EWTW_i$ is the Bloomberg Commodity Equal-Weighted Target Weight of the individual commodity futures contract, rounded to 8 decimal places.

$BCOM\_CW_i$ is the BCOM closing weights of commodity futures contract i.

Index Rebalancing

The Indices are rebalanced quarterly after the close of business on the last business day in December, March, June, and September. The target weights are applied to the index by calculating index units call Commodity Index Multipliers (CIMs). The Index Base Date CIM and the ongoing CIMs are used maintain continuity in the Index.

CIM's are calculated using the following formulas:

Base Date CIM Calculation:

$$CIM = \frac{EWTW_i * 100}{NCSP_t}$$

Where:

CIM is the Commodity Index Multiplier used to apply the Target Weight of the individual commodity futures contract, rounded to 8 decimal places.

$EWTW_i$ is the Commodity Equal-Weighted Sector Annual Target Weight of commodity futures contract i.

$NCSP_t$ is the **Next Contract Settlement Price** on Business Day t, using price conversion.

Monthly CIM Calculation

$$CIM = \frac{EWTW_i * 100}{NCSP_t} * AF$$

**Preformed for each commodity group*

Where:

CIM is the Commodity Index Multiplier used to apply the Target Weight of the individual commodity futures contract, rounded to 8 decimal places.

$EWTW_i$ is the Commodity Equal-Weighted Sector Target Weight of commodity futures contract i for each Rebalancing Day.

$NCSP_t$ is the Next Contract Settlement Price on Business Day t.

AF is the Adjustment Factor.

$$AF = \frac{\sum_i CIM_r * NCSP}{100}$$

Where:

CIM_r is the previous Commodity Index Multiplier.

$NCSP$ is the Next Contract Settlement Price on Business Day t.

Index Rolling

The Index hold a long positions in commodity futures. To maintain a long position, contracts are 'rolled' from the expiring futures contract to a new contract farther down the futures curve with a longer expiry date. The calculation of the Index follows the roll schedule based on the commodity contract calendar listed in Table 9 of the BCOM methodology.

The Index will roll from the Lead Contract to the Next Contract from the first to the fifth Business Day of each month at 20% (1/5) each Business Day. If a Market Disruption Event ("MDE") occurs during the roll period (Business Days 1 through 5), the roll weight will be "held". The roll weight will catch up on the next Business Day when a MDE is not present. Table 3 is an example of the rolling process during the February Roll Period of 2008 for Wheat.

Table 3: Rolling Example February 2008

					Yesterday Roll Weight		Today Roll Weight	
Date	Business Day	Commodity	Roll Out Contract	Roll In Contract	Roll Out	Roll In	Roll Out	Roll In
2/1/2008	1	Chicago Wheat (W)	W H08	W K08	100%	0%	80%	20%
2/4/2008	2	Chicago Wheat (W)	W H08	W K08	80%	20%	60%	40%
2/5/2008	3	Chicago Wheat (W)	W H08	W K08	60%	40%	40%	60%
2/6/2008	4	Chicago Wheat (W)	W H08	W K08	40%	60%	20%	80%
2/7/2008	5	Chicago Wheat (W)	W H08	W K08	20%	80%	0%	100%
2/8/2008	6	Chicago Wheat (W)	W H08	W K08	0%	100%	0%	100%

Index Calculation

Index Levels are determined on a day on which BCOM is open for business. If a commodity futures contract **Settlement Price** is unavailable on a Business Day when BCOM is open, the last available official Settlement Price will be used for the calculation of the Index. The official Index Level precision is eight decimal places.

The ER Index Level is calculated as follows:

$$IndexER_t = IndexER_{t-1} * (1 + DER)$$

Where:

$IndexER_t$ is the ER Index Level on Business Day t, rounded to 8 decimal places.

$IndexER_{t-1}$ is the ER Index Level on the Business Day immediately preceding Business Day t.

DER is the Daily ER of the commodity futures contracts.

The Daily ER is calculated as:

$$DER = \left(\frac{\mathrm{WAV}}{PWAV} - 1\right)$$

Total Return Index Level (leveraged, and inverse indices) is calculated as follows:

$$IndexTR_t \; = IndexTR_{t-1} \times \left(\frac{IndexER_t}{IndexER_{t-1}} + IR_{\,t}\right)$$

Where:

$IndexTR_t$ is the Total Return Index Level on Business Day t, rounded to 8 decimal places.

$IndexTR_{t-1}$ is the Total Return Index Level on the Business Day immediately preceding Business Day t.

$IndexER_t$	is the ER Index Level on Business Day t.
$IndexER_{t-1}$	is the ER Index Level on the Business Day immediately preceding Business Day t.
$IR_{\,t}$	is the Treasury Bill Daily Return, calculated as

$$IR_{\,t} = \left[\frac{1}{1-\frac{91}{360}\times TBR_{t-1}}\right]^{\frac{D}{91}} - 1$$

Where:

TBR_{t-1}	is the 13-week (3 -month) US Treasury Bill ("T-Bill") Rate, the rate used is the most recent weekly auctioned high discount rate (ticker: USB3MTA Index).
D	is the number of calendar days between Business Day t, and the previous Business Day (i.e. 3 for weekend)

Weighted Average Value ("WAV") on Business Day t is calculated as:

$$WAV = \sum_i CIM1 * YLRW * \frac{LCSP_t}{L} + CIM2 * YNRW * \frac{NCSP_t}{L}$$

Where:

$CIM1$	is the Commodity Index Multiplier for Lead Contract.
$YLRW$	is the Yesterday Lead Roll Weight, i.e., the roll weight of commodity futures contract i on the Business Day immediately preceding Business Day t.
$LCSP_t$	is the Lead Contract settlement price on Business Day t.
$CIM2$	is the Commodity Index Multiplier for Next Contract.
$YNRW$	is the Yesterday Next Roll Weight, i.e., the roll weight of commodity futures contract i on the Business Day immediately preceding Business Day t.
$NCSP_t$	is the Next Contract settlement price on Business Day t.
L	is the lot size of the futures contract.
i	designates each individual commodity

Previous Weighted Average Value ("$PWAV$") on Business Day t is calculated as:

$$PWAV = \sum_i CIM1_{t-1} * YLRW * \frac{LCSP_{t-1}}{L} + CIM2_{t-1} * YNRW * \frac{NCSP_{t-1}}{L}$$

Where:

$CIM1_{t-1}$	is the Commodity Index Multiplier for Lead Contract on the Business Day immediately preceding Business Day t.
$YLRW$	is the Yesterday Lead Roll Weight, i.e., the roll weight of commodity futures contract i on the Business Day immediately preceding Business Day t.
$LCSP_{t-1}$	is the Lead Contract settlement price on the Business Day immediately preceding Business Day t using price conversion.
$CIM2_{t-1}$	is the Commodity Index Multiplier for Lead Contract on the Business Day immediately preceding Business Day t.
$YNRW$	is the Yesterday Next Roll Weight, i.e., the roll weight of commodity futures contract i on the Business Day immediately preceding Business Day t.
$NCSP_{t-1}$	is the Next Contract settlement price on the Business Day immediately preceding Business Day t.
L	is the lot size.
i	designates each individual commodity

The Bloomberg Commodity Equal-Weighted Sector Daily Hedged (excess return) Index Level is calculated as follows:

$$HI_{ER,t} = HI_{ER,t-1} * (1 + \frac{FX_{t-1}^{A}}{FX_{t}^{A}} * \left(\frac{I_{USD,ER,t}}{I_{USD,ER,t-1}} - 1\right))$$

Where:

$HI_{ER,t}$ is the value of the Daily Hedged Excess Return Index on index business day t.
FX_t FX Spot price as obtained from the source and time summarized in the table below. $I_{USD,ER,t}$ is the value of the USD Excess Return Index on Business Day **t**.
A Quotation Exponent as defined in the table below:

Currency	A	FX Fixing Source	FX Fixing Time
GBP	1	Bloomberg BFIX	16:00 London

The Multi-Tenor Daily Hedged (total return) Index Level is calculated as follows:

$$HI_{TR,} = HI_{TR,t-1} * \left(\frac{HI_{ER,t}}{HI_{ER,t-1}} + IRR_t\right)$$

Where:

$HI_{TR,}$ is the value of the Daily Hedged Total Return Index on Business Day t.
$HI_{ER,}$ is the value of the Daily Hedged Excess Return Index on Business Day t.
IRR_t is the Interest Rate Return index business day t, generally defined as:

$$IRR_t = \left(1 - \frac{N * (ARR_t - Spread)}{D}\right)^{\frac{d_{t-1} - d_t}{N}} - 1$$

Where:

ARR_t is the Applicable Reference Rate on Business Day t defined as the latest reference rate published as of a previous day prior to such Business Day t.
N is the currency market convention Numerator as defined in the table below.
D is the currency market convention Denominator as defined in the table below;

Currency	N	D	Reference Rate	Spread	Ticker
GBP	1	365	SONIA O/N Deposit rate	0	SONIO/N Index

Both excess and total return index levels are rounded to 8 decimal places.

Section 4: Market Disruption Events

Market Disruption Events (MDE) can occur to commodity futures for several reasons:

a) The termination or suspension of, or material limitation or disruption in, the trading of any future contract used in the calculation of the Index on that day
b) The settlement price of any such contract reflect the maximum permitted price change from the previous day's settlement price, based on limits set by commodity exchanges
c) The failure of an exchange to publish settlement prices.

If a MDE occurs with respect to the Commodity Equal-Weighted Sector Index family during any month of the "Roll Period" for either the lead or next contract, the daily roll of the relevant futures contract will be held for that Business Day. On the following Business Day on which a Market Disruption Event does not occur, the roll weight will account for the current days roll weight and the previous Business Day (MDE's) roll weight.

If a MDE persists for four consecutive Index Business Days immediately following the original Index Business Day on which a MDE occurs, then the Index Administrator shall determine what further actions it may reasonably take.

If, on any Index Business Day, a MDE occurs or is occurring that the Index Administrator determines, in its sole discretion, materially affects the Index, the Index Administrator may defer or suspend the calculation and publication of the Index Value and any other information relating to the Index until the next Index Business Day on which such disruption event is not continuing.

Section 5: Benchmark Governance and Review

Data Providers and Data Extrapolation

Please refer to the BISL Benchmark Procedures Handbook available here.

Benchmark Governance, Audit and Review Structure

Please refer to the BISL Benchmark Procedures Handbook available here.

Internal and External Reviews

Please refer to the BISL Benchmark Procedures Handbook available here.

Index and Data Reviews

Please refer to the BISL Benchmark Procedures Handbook available here.

Exchange Settlement Price Delays

In the event an exchange delays the pricing of future settlements pertaining to the Bloomberg Representative Agriculture Index Indices, BISL will delay the publication of Index Levels to vendors and delivery of index data files.

Error Corrections/Restatement Policy

Please refer to the BISL Benchmark Procedures Handbook available here.

Exchange Settlement Price Amendments

On the occasion when an exchange amends the Settlement Price of a contract used in the Bloomberg Representative Agriculture Index Indices prior to 7 PM EST, BISL will send an index announcement following the discovery to inform all clients of the correction. BISL will then recalculate, republish, and redistribute end-of day files.

Real-time Distribution

BISL strives to provide accurate real-time calculation of its indices, however the following circumstances may occur during real-time dissemination hours.

- Incorrect index levels can be disseminated.
- Indices may stop disseminating.
- Indices may disseminate stale prices.

Expert Judgment

Please refer to the BISL Benchmark Procedures Handbook available here.

Reinvestment of Dividends and Coupons

Dividends and coupon payments play no direct role in this Index Methodology Handbook, and are therefore not accounted for by the Index.

Section 6: Index Terms

"Base Index Level" means the starting Index Level of 100 for each of the Indices.

"BCOM" means the [Bloomberg Commodity Index]

"BCOM Closing Weights" means the closing constituent weights of the Bloomberg Commodity Index (BCOM)

"BCOM Target Weights" the annual target weight of the Bloomberg Commodity Index (BCOM), otherwise known as Commodity Index Percentages in the BCOM methodology

"BISL" means Bloomberg Index Services Limited.

"PROC" means the Benchmark Oversight Committee.

"Business Day" means any day on which BCOM is open for business.

"**Commodity Index Multiplier (CIM)"** means the value of one as described in Section 3.

"Index Administrator" means BISL.

"Index Base Date" means the first date of the Index history as described in Section 1.

"Index Commencement Date" means the date each of the Indices is first made available on the relevant Bloomberg Page, i.e., December 16th, 2022.

"Index Level" means, in respect of the Index and a Business Day, the value of the Index on such Business Day, calculated in accordance with the methodology described in Section 3.

"PROC" means the Product, Risk and Operations Committee.

"Lead Contract" means the rolling out commodity futures contract as defined in Table 5.

"Lead Contract Settlement Price" means the official settlement prices provided by the exchange of the rolling out commodity futures contract defined in Table 5.

"Market Disruption Event (MDE)" has the meaning given to such term in Section 4.

"Next Contract" means the rolling in commodity futures contract as defined in Table 5.

"Next Contract Settlement Price" means the official settlement prices provided by the exchange of the rolling in commodity futures contract as defined in Table 5.

"Rolling" means the commodity futures contracts are 'rolled' during the Roll Period from the expiring futures contract (Lead Contract) to a new contract farther down the futures curve with a longer expiry date (Next Contract). After the Roll Period, the former Next Contract becomes the new Lead Contract.

"Roll Period" means the first to fifth Business Day of each month, at 20% (1/5) each Business Day

"Settlement Price" means the official settlement prices provided by an exchange.

"Treasury Bill Daily Return" means the return of cash collateral invested in the 3-Month T-Bill.

Accessing Index Data

Bloomberg Terminal®	Bloomberg indices are the benchmarks of choice for capital markets investors. The Bloomberg Index Browser IN <GO> displays the latest performance results and statistics for the indices as well as history. IN presents the indices that make up Bloomberg's global, cross-asset Index families into a hierarchical view, facilitating navigation and comparisons. The "My Indices" tab allows a user to focus on a set of favorite indices. Bloomberg's Portfolio & Risk Analytics solution (PORT <GO>) includes tools to analyze the risk, return, and current structure of indices. PORT includes tools to analyze performance of a portfolio versus a benchmark as well as models for performance attribution, tracking error analysis, value-at-risk, scenario analysis, and optimization.
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